1888.

NEW ZEALAND.

GISBORNE HARBOUR WORKS

(REPORT ON), BY H. P. HIGGINSON.

Presented to both Houses of the General Assembly by Command of His Excellency.

The ASSISTANT SECRETARY, Marine Department, to Mr. H. P. HIGGINSON.

SIR,— Marine Department, Wellington, 27th March, 1888.

The expenditure on the Gisborne Harbour works being (by section 10 of "The Gisborne Harbour Act Amendment Act, 1887") limited to £65,000 until the sanction of the General Assembly has been first obtained to further expenditure, and the Harbour Board, being desirous of having a report on the works with the view of obtaining such sanction, have, in order to give weight to the report as being conducted by an impartial person and not by a nominee of the Board, requested the Government to appoint an Engineer to report on the works, and the capabilities of the district to bear the burden of the cost of their construction.

I have therefore been directed by the Minister having charge of this department to request that you will be good enough to proceed to Gisborne at as early a date as possible, there to make a full inquiry into the present condition and prospects of the harbour works, with the view of reporting on —(1) The present and probable future effect of the proposed works; (2) the amount that will require to be expended before the works will be of service to shipping; (3) the amount it will cost to complete the works; (4) the amount of revenue that will be raised by the Board, at the present rates, by (*a*) wharfage and charges on goods, and (*b*) other port charges on shipping; (5) the annual amount that will require to be levied by means of a rate under "The Gisborne Harbour Board Empowering Act, 1884" (in addition to the revenue derived from wharfage and port charges, and from the rents and proceeds of the Board's endowments of land), so that the Board will be able to meet all liabilities in connection with interest and sinking fund on the present loan of £200,000, and also provide for the maintenance of works and for working expenses, and, if the present rate authorised by the Act will not be sufficient for these purposes, what rate will have to be imposed; (6) the capabilities of the district to bear the burden of the present rate, or such a rate as it may be necessary to impose, without placing too heavy a tax on the inhabitants and hindering the progress of settlement; and, generally, on any other matters in connection with the Gisborne Harbour works that you may consider desirable for the information of Parliament.

I have, &c.,

LEWIS H. B. WILSON,

H. P. Higginson, Esq., M. Inst. C.E., Wellington. Assistant Secretary.

Mr. H. P. HIGGINSON to the Hon. the MINISTER, Marine Department.

SIR,— Wellington, 3rd May, 1888.

In compliance with instructions conveyed to me by letter dated the 27th March, 1888, I have the honour to state that I proceeded to Gisborne upon the 6th April, and upon arrival there put myself in communication with the Harbour Board authorities, with the view of making myself thoroughly acquainted with both the past and present affairs of the Board, and the works now in progress. The Chairman, Secretary, Engineer, and members of the Board afforded me every opportunity of becoming conversant with its position. I was also supplied with full details of the views held by the residents, who were both antagonistic and in favour of the construction of the breakwater in its present authorised site.

While in Gisborne I had opportunities afforded me of visiting the various portions of the district, and hearing the views of the country settlers upon the matters about which I now report. I also visited the oil-springs, where I examined the bore upon the South Pacific lease, which lately struck oil at a depth of 1,320ft., and found oil standing in the pipe 6ft. below the surface of the ground. I visited the site of the proposed new bore upon the same lease, where the derrick and machinery are fixed in position; and also the Minerva Company's lease, where the bore had reached a depth of 765ft. since December last, and at which the oil-bearing stratum was expected to be tapped at a depth of about 1,100ft. A report has lately been made upon this oil-district by Mr. Gordon, Mining Engineer, which will undoubtedly give full particulars. I attended a meeting of the Harbour Board at their request, and heard the views of the members upon its position. I also received a deputation of residents who are dissatisfied with the present scheme, headed by Mr. W. L. Rees, and heard a full explanation of their opinions, supported by documents with which I was afterwards supplied.

Before commencing to report under the different heads into which my inquiry has been directed, I will shortly describe the measures adopted by the Board in order to determine and fix upon the plans and site, both before and after the commencement of the work.

Upon the 12th May, 1885, a petition was presented to the Board, signed by 200 residents, praying that the breakwater might be approached from the town side of the Turanganui River.

On the 13th October, 1885, the Engineer exhibited his sketch of proposed harbour works to the Board, and was instructed to proceed to Wellington at an early date, for the purpose of obtaining the approval of the Marine Department to the plans.

At a meeting of the Board on the 22nd December, 1885, the following resolution was passed: "That the alternative plan laid before the Board [Stony Point] this evening be forwarded to the Marine Department, and that the Government be requested to give its sanction to either plan approved at the earliest possible date."

Upon the 29th December, 1885, a telegram was received from the Minister, Marine Department, to the following effect: "Your Secretary's letter of the 24th instant received. Colonial Marine Engineer has examined sketch-plans referred to therein, and has recommended the Government to approve the first plan submitted, with slight modification marked thereon by him; and His Excellency will be advised accordingly at next meeting of Executive Council." The present approved plans, signed by the Governor in Council on the 29th December, 1885, were received by the Board from the Marine Department on the 11th January, 1886.

Upon the 29th October, 1886, the Board wrote to the Minister, Marine Department, intimating that, as their Engineer had prepared plans differing somewhat from Sir John Coode's, they sent their Engineer with them to Wellington; where he was informed that it would be unnecessary to consult Sir John on the matter, provided that the Minister was satisfied. These plans were left in Wellington, and ultimately approved by the Governor in Council. As it was some time before this was done, the Engineer prepared an alternative plan of a breakwater, now known as the "Stony Point plan." The department did not consider that this possessed advantages over the first, which had been authorised in December; and the Board, being satisfied with the scheme, began work at once, and have expended—at that date—about £20,000 on railway, plant, wharf, viaduct, and block-yard.

On the 14th September, upon the requisition of Mr. W. L. Rees and others, a public meeting was held to protest against the breakwater being built on the authorised site, and to advocate its construction at Stony Point. A committee was formed, with Mr. W. L. Rees as chairman, who waited on the Board and laid their views before them. The Board agreed to ask Messrs. Blackett, Goodall, and Napier Bell, with their own Engineer, Mr. John Thomson, to consult as to the best site for the breakwater; but, before doing so, decided to lay the matter before Mr. Blackett to see if he considered there were sufficient grounds for making the change, and instructed their Engineer to draw up a report stating the relative advantages of the two sites. This was laid before the Board at their meeting on the 12th October, while at the same meeting Mr. Rees's committee sent in a document formulating their views. Before submitting the latter to Government, the Board asked their Engineer to report to them on the "objections and suggestions." This was done in accordance with the following resolution of the Board: "That the report of the committee of the public meeting, and objections, be referred to the Engineer to consider and report thereon; and that the Engineer's report, along with the copy of objections, be forwarded to the Governor with a request that if sufficient cause be shown the Governor will sanction the reconsideration by a consulting engineer of the several schemes of a breakwater."

"I now enclose these three documents, with the object of asking if Mr. Blackett considers there are sufficient grounds for annulling the authorised plan in favour of Stony Point; and, if so, does he think it necessary to call in Messrs. Goodall and Bell?"

The reply received from the Marine Department in answer, dated 29th November, 1886, was as follows: "I have the honour, by direction of the Minister having charge of this department, to acknowledge the receipt of your letter of the 29th ultimo, submitting to the Government the proposal which has been made to the Board that the Gisborne breakwater should be constructed at Stony Point instead of at the site approved by the Governor in Council; and, in reply, I am to state that the Government, after having carefully considered the matter, see no reason for agreeing to the proposed change of site. With regard to the question as to the cost of the breakwater, I am to reiterate the statement made in letter from this department to the Board, No. 156/47, of the 9th of March last, that the responsibility of finding the funds to defray the whole cost of carrying out the plans will rest entirely on the Harbour Board, and in no manner with the Government."

The foregoing extracts from the correspondence will show that the Board used every endeavour to have the most suitable site fixed upon.

I will now shortly describe the various schemes that have been from time to time proposed.

The breakwater now under construction is known as the "authorised" or "river" scheme, the alternative design prepared by the Board's Engineer being the "Stony Point" scheme. There are also Sir John Coode's, Mr. Rees's, and a comprehensive design for a deep-water harbour of refuge by the Board's Engineer. Another scheme is also shown upon the plan attached to Sir John Coode's report, and called Mr. Drummond's, but of which I have no particulars, and therefore do not refer to it again. Sir John Coode's design, dated December, 1880, bears a strong resemblance to that prepared by him for Timaru. It took the form of a partly-enclosed area open towards the Waikanae Beach, and connected to the shore by a high-level iron viaduct, 1,410ft. in length, the estimated cost being £246,400. The area enclosed is about six acres, with a depth at entrance by present soundings of 21½ft. at low-water spring tides. His design evidently took this form in order to avoid intercepting the sand-bearing current that he was led to believe set along the beach from the eastward. The Stony Point scheme was prepared with the view of obtaining greater depth of water (25ft.) at a shorter distance from shore, and at the same time affording more room for vessels to round up under the shelter of the work during south-east gales. It also kept well clear of the Turanganui River, and afforded greater area for reclamation purposes. Mr. Rees's scheme had much the same objects in view, but was some distance farther to the eastward. It ran more directly into a depth of 30ft. of water. The "harbour of refuge" was still farther to the eastward: it was formed by two converging piers like that built at Madras, with 42ft. of water at the entrance, and enclosing an area of about fifty acres. The authorised scheme was prepared by the Board's Engineer after careful inquiry into the merits of the different proposals, and with regard to the funds at his disposal, and was approved by the Government with a slight alteration in its direction.

Upon comparing the soundings taken for Sir John Coode with those more recently taken by the Harbour Engineer, I find a considerable difference, denoting either that the sandy bottom is changing or that there had been carelessness in taking them originally—the three-fathom line agrees tolerably well, but not the others. Captain Kennedy, an old resident, asserts that the bay has shoaled 4ft. since 1861, and that there is less water on the middle bank than formerly. This evidence, however, requires support.

I attach a sketch-plan on which are shown the various schemes suggested, with an abstract of particulars concerning them in a condensed form.

I will hereafter give further particulars of those designs which have been or may yet be considered suitable to the requirements of the port, and will now proceed to report under the different heads indicated in my letter of instructions.

1. "The Present and Probable Future Effect of the Proposed Works."

I understand this to mean the works as authorised by Government.

Their construction is now in proper train, all preliminary works being completed. A railway, 3¾ miles in length, has been laid down to Kaiti Beach, from whence stone is hauled for concrete. Cement-sheds, block-yard, stone-crushers, and workshops have been erected, and which are most complete and suitable, the arrangement being all that could be desired. A wharf and viaduct of timber-work, capable of carrying 30-ton blocks, has been constructed, extending from the block-yard on the riverbank to the root of the breakwater, a distance of 1,580ft. The concrete pier has been carried out for a length of 215ft., commencing 100ft. above low water or the Bush Beacon. There are also 486 concrete blocks stacked in the yard, ready for insertion in the work as required. The plant imported for the work seems very complete, and of most suitable design. Its arrangement is also judicious, and calculated to enable the Board to prosecute the work in a rapid and economical manner.

So far as the work has been extended, the effect has been to cause the ebb-tide to clear the inner face of sand and silt, the rock being clean to low-water mark. In all probability this will continue for some distance as the work progresses, a result that was looked for by the Engineer when designing it. It is doubtful, however, how far out this effect will be felt, as upon reaching deeper water the force of the tidal current will be much reduced. Upon the western bank of the river at its mouth a sandspit has shown a tendency to encroach upon the channel at its narrowest part. This only occurs for a short distance below high-water mark, and is evidently caused by the flood-tide flowing into the river parallel with the Waikanae Beach, whereas formerly it had a wider and more direct entrance, the current not being concentrated in the same direction. It is maintained by some that this action has carried a considerable quantity of sand into and some distance up the river, where the water is said to be shoaling. I think that this latter result can be in a great measure traced to the long absence of floods, which when they occur will probably restore its normal condition. It is also feared that the western spit will extend seawards, keeping pace with the construction of the pier. I do not think that there is any proof of this so far, as for some distance above low water this spit consists of papa rock, the sand in question merely working eastwards along the beach and into the river by the united action of the waves and flood-tide. The pier is not yet far enough advanced to afford shelter to this portion of the beach from the southerly swell: when this is the case this action will probably cease.

There is no evidence of the sand travelling permanently in either direction. The beach has a very stable appearance, and in my opinion can only come from the prevailing heaviest seas working it along the Kaiti Beach, which for nearly the whole distance to the Island consists of a papa reef. Since the commencement of the work sand has collected in the angle formed between the viaduct and Maori Point, and which has been for some time used in the construction of blocks; the quantity is, however, insignificant.

Judging of the probable effect of the works upon the river, I think that the bar will improve. The river-channel, after being scoured out by a flood, will also retain a more permanent character. A great deal might be done to improve the channel at the entrance by a small expenditure in removing the rocks now existing in mid-channel, and by blasting away the papa reef on the eastern

side, and straightening what is now a tortuous and narrow entrance. A sum of £4,000 is provided in the estimates for a groin upon the Waikanae Beach. This might be carried out in the shape of a timber training-wall to protect that beach to low-water mark, which would keep the sand from entering, and at the same time concentrate both flood- and ebb-tide over the bar, thereby improving the river-entrance for small craft, which will always prefer to reach the wharf in close proximity to the town. The extremity of the present work just reaches the shallowest part of the bar, which the Harbourmaster, Mr. J. Bennett, states was much closer in, with a wider entrance, before the breakwater had attained its present length. The channel now runs almost alongside the end of the breakwater, and close to the extremity, so that he fears both bar and spit will follow the works outward; also that upon their completion the depth of water will decrease in consequence of the deposit from the river after flood.

I consider that the work is not yet far enough advanced to prove in any measure what the permanent effect will be. So far, the action has only been what was conjectured would take place. That a flood in the river would scour out the sandbanks near its mouth and deposit the material in the bay is undeniable. This has, probably, always occurred; but, when works contemplated upon both sides of the river are constructed, I do not anticipate that the sand forming the bar will be again driven inside. When sufficient protection is afforded, the bar will be flattened out by the first flood; and, being protected from the action of the sea, it will not be again driven back to shallow the entrance, as is now always the case.

I examined both the Taruheru and Waimata Rivers, which unite to form the Turanganui. The former is tidal for six miles, beyond which it is a mere creek. The latter is the main tributary, draining about a hundred square miles, and is tidal for nearly five miles from its junction. Both these rivers have decided banks, well protected with vegetation, and betraying little action from flood-scour. At low tide the shallows are covered with fine mud or silt. Above the tidal limit the latter river has a decided fall over a rocky and gravelly bed, and, at the time of my visit, could be easily forded on foot. Ordinary freshes occur yearly, during which the water rises a little above spring-tide level. Heavy floods are experienced only at long intervals, that of 1875 having risen 5ft. above high-water mark, and that of 1879 about a foot higher. The features of the banks are reported to show little change, and even during the heavy floods very little timber or sand is said to be brought down; the banks of the Turanganui near the town consisting of pure sand resembling that in the bay, which is evidently carried up on the flood-tides. A certain amount of silt and fine sand in suspension must undoubtedly be brought down; but this would probably be conveyed by the current along the face of the pier well into the bay. The heaviest seas roll in from the south-east, in which direction the bay is quite open, being dangerous to vessels at anchor in the roadstead, or working the bar. These seas break evenly, and more or less parallel to the Waikanae Beach. The mouth of the river, being to a great extent sheltered by outlying reefs, does not experience their full force, though sufficiently to render the bar dangerous, and drive the sand back, reducing the depth of water upon it. The farther the present work is extended, the greater the protection afforded to the entrance of the river.

In the preamble to "The Gisborne Harbour Board Empowering Act, 1884," I find that it was intended to afford accommodation generally to shipping of large tonnage, and to form a "harbour of refuge for the East Coast." A considerable section of the ratepayers hold the view that, whatever scheme is carried out, it should be so designed as to form a harbour that eventually, at all events, would admit the largest class of ocean-going vessels in all states of the weather; and it is with this object that the Stony Point scheme is still advocated. The Board's Engineer, in a report, pointed out that, although that scheme provided 24ft. of water against 21½ft. by the authorised one for the same expenditure of £175,000, yet an extension of the work by an expenditure of £250,000 would only take the former into the same depth, while the latter would reach 26ft. to sand and 30ft. to rock; also that the Stony Point scheme would reach deeper water first, but could not be utilised until nearly completed, owing to the foul and rocky bottom inshore; whereas the authorised scheme could be made use of as the work progressed, and extended at a future date, obtaining 5ft. greater depth for the expenditure of an additional £50,000. The Colonial Marine Engineer must have held the same views when he approved of the plan now being carried out.

A careful examination of the plans and soundings leads me to the conclusion that neither scheme will, for the expenditure of £250,000, constitute a harbour of refuge for the larger vessels trading to New Zealand, such as the "Kaikoura" and "Tainui." These boats draw 25ft. loaded, requiring in rough weather not less than 31ft. to 33ft. of water. There would be insufficient room in which to approach the shelter of the work and manœuvre vessels of that size. It is questionable whether even steamers would run for shelter before a south-east gale into a landlocked bay, but would in preference run round the East Cape. Either of the two schemes, if extended, could reach deeper water; being converging angles, they would meet in a depth of 30ft. Steamers of the size of the "Manapouri" and "Wakatipu," requiring 22ft. in fine and 25ft. in rough weather, are of a class frequenting the port, and would be expected to come alongside. So large an expenditure as £175,000 (which is the available amount) should at least afford accommodation for these boats in rough weather; yet I find that the Stony Point scheme has barely sufficient water at its extremity, while the authorised scheme does not, unless the scour along the face of the work removes the sand to the anticipated depth of 23ft., in which case there would be only a narrow gut alongside.

Comparing the two schemes, I consider that at Stony Point gains deeper water for the expenditure of the present funds, and at the same time, from its more eastward position, provides a larger area of deeper water and allows more room to vessels approaching it; also that, being farther from the river, there is less chance of shoaling from flood-deposits. The disadvantages are that it can be made little or no use of until approaching completion, owing to a foul and rocky bottom inshore. Its position is also farther from the town. I do not place much value on the

possibility of reclaiming so large an area as twenty-seven acres. It is highly probable that the cost of executing this would be so great, and the demand for its use so remote, that it would prove anything but a paying speculation. I am also of opinion that the direction of this work is not sufficiently in line with the prevailing seas.

The advantages of the authorised scheme are that the work can be made use of as it progresses, the anticipated tidal scour keeping the inner face free from sand. A serviceable depth of water can be sooner reached and at less cost than at Stony Point, with a sandy bottom clear of rocks. It is also in closer proximity to the town. Its disadvantages are that there is not sufficient sea-room or depth of water in which to manipulate vessels of the "Manapouri" class during heavy weather. From its proximity to the river any deposit therefrom must sooner affect the area enclosed than if placed at a greater distance. A vessel anchoring under its shelter near the extremity would find herself riding in not more than 18ft. of water, with a rapidly-shallowing beach astern; consequently such vessels as the "Manapouri" could only warp alongside in fine weather.

In order to accommodate the largest vessels in any weather, I consider the most suitable site would be to start at or near Stony Point more or less upon the line shown as Mr. Rees's scheme, thence running out nearly parallel with the present work; or else starting about 1,000ft. eastward of the river, and running in the same direction. Both schemes would reach 32ft. of water, and enclose a large area of deep water, including the positions usually occupied by the Union Company's steamers when at anchor. There would be ample room for vessels approaching shelter in any weather. The cost of either scheme upon such lines would be not less than £300,000, but could be made little use of until about £200,000 had been spent, as out to the 4-fathom line the bottom is covered by rocks, which would require a considerable time and heavy expenditure to remove.

I am therefore of opinion that, if a depth of 32ft. low-water spring tides is necessary at a probable expenditure of £300,000 to accommodate the largest vessels, either of these latter schemes is to be preferred.

But if on the other hand a smaller class of vessel is to be provided for, drawing from 12ft. to 17ft., at an expenditure of £175,000 only, the authorised scheme is the best suited, especially when it is considered that the pier can be brought into use as the work progresses. I am of opinion that this will never afford a suitable harbour for large vessels unless carried out to a length of 3,500ft., into 32ft. of water, the cost of which would be £310,000; and even then it will not provide nearly so large an area of deep water as would be the case by either of the schemes coloured red and lake on sketch-plan.

2. "The Amount that will require to be expended before the Works will be of Service to Shipping."

The steamship "Australia," which is a regular trader to the port, draws 11ft., consequently would require at least 15ft. alongside the pier. In order to obtain this, the work must be extended another 1,000ft., where there is 13¼ft. to sand and 17ft. to rock. It is possible that the tidal scour will increase the depth, so that at that distance 15ft. would be available. The Engineer estimates that the cost of the work up to this point will be £101,000. The following table will illustrate the conditions at various points as the scheme is carried out:—

Length from Root. Ft.	Estimated Cost. £	Depth at Low-water Spring-tide. To Rock. Ft.	To Sand. Ft.
211	51,700	—	—
700	76,000	12½	9½
1,160	101,000	17	13¼
1,530	126,000	20	15½
1,900	151,000	22	18½
2,175	176,000	24½	21½

The cost quoted is for expenditure on works only. The amount of the loan set apart for works being £175,000, as £25,000 was reserved on account of a sinking fund. The amount set apart for the work has also been reduced by the sum of £14,941 6s. 8d., which has been charged to loan, as provided in the Amendment Act, 1884, leaving available £160,058 13s. 4d. The amount to be expended before the work will be of service depends entirely upon the class of vessel to be accommodated. I can therefore only refer to the above table for the information.

3. "The Amount that it will cost to complete the Works."

The authorised scheme was designed to reach a point 2,050ft. from the Bush Beacon, or 2,150ft. from the commencement of the concrete pier, as 100ft. was first built upon which to erect the block-setting crane. The estimated cost was as follows:—

Railway, block-yard, buildings, and surveys	£16,000	
Plant	16,200	
Freight, expenses, and erection of plant	3,000	
Wharf and viaduct	7,500	
		£42,700
Groin on west beach, 400ft.		4,000
Railway bridge		5,000
Breakwater pier, 2,050ft. long		123,300
Total estimated cost		£175,000

I see no reason to doubt that the works provided for can be completed within this sum. So far, the preliminary works have cost £1,714 less than the sum allowed in the estimate. It is probable that additional works may be required in course of time, such as wharves, moorings, &c.

I have gone through the actual cost to date, which includes all plant and preliminary work, the construction of 486 concrete blocks now stacked in the yard, and 215ft. of the completed concrete pier. The following are the particulars of expenditure out of loan to April, 1888:—

	£ s. d.	£ s. d.
Cash and materials in hand	3,058 13 6	
Blocks in yard	6,466 3 4½	
		9,524 16 10½
Preliminary surveys and plans ...	...	627 7 7
Railway, block-yard, &c.	11,790 1 2	
Sheds, shops, and crushers	1,894 18 11	
		13,685 0 1
Plant (net cost)	15,392 16 6	
Exchange, freight, &c.	3,642 4 8	
		19,035 1 2
Wharf and viaduct	... ...	5,638 14 7
Concrete pier	... ...	6,246 13 5¾
Engineering, &c....	... ...	2,000 0 0
Expenditure on works ...	... ...	56,757 13 9¼
Transfer to General Account, being premium on loan, as legalised by Act	... ...	4,107 5 0
Transfer to General Account, being payment of overdraft, as legalised by Act	... ...	10,834 1 8
Total expenditure out of loan...	... ...	£71,699 0 5¼

4. The Amount of Revenue that will be raised by the Board at the Present Rates by (a) *Wharfage and Charges on Goods,* (b) *other Port Charges on Shipping.*

In replying to this it is unnecessary to separate the charges, but I will give a return of the actual amount received for the year ending the 31st December, 1887: License-fees, £51 17s. 6d.; port charges, £614 18s. 3d.; wharf dues, £1,895 13s. 11d.; storage and sale of water, £26 8s. 10d.; weighbridge fees, £40 8s. 6d.: total revenue for 1887, £2,629 7s.

For the current year the revenue from these sources has been estimated by the Secretary as follows: License-fees, £50; port charges, £600; wharf dues, £2,000; storage and sale of water, £25; weighbridge fees, £40: estimated revenue for 1888, £2,715.

There appears to be no reason to anticipate any material increase in trade during the current year, seeing that the exports from the Port of Gisborne have varied little during the last four years, as will be hereafter shown. I am therefore of opinion that the estimated revenue is likely to be correct. The present rates are higher than are now charged at either Oamaru or Timaru; it will therefore not be advisable to calculate upon increasing the revenue by the imposition of a higher scale.

5. "The Annual Amount that will require to be levied by means of a Rate under 'The Gisborne Harbour Board Empowering Act, 1884' (in addition to the Revenue derived from Wharfage and Port Charges, and from the Rents and Proceeds of the Board's Endowments of Land), so that the Board will be able to meet all Liabilities in connection with Interest and Sinking Fund on the present Loan of £200,000, and also provide for the Maintenance of the Works and for Working Expenses; and, if the present Rate authorised by the Act will not be sufficient for these Purposes, what Rate will have to be imposed."

The estimated receipts and expenditure for the year ending 31st December, 1888, are as follow:—

GENERAL ACCOUNT.

Receipts.	£ s. d.	£ s. d.	*Expenditure.*	£ s. d.	£ s. d.
Licenses	50 0 0		Refund to Loan Account, $\frac{1}{10}$ overdraft	..	1,083 8 2
Port charges	600 0 0		Advertising and printing ..	..	50 0 0
Wharf dues	2,000 0 0		Salaries and allowances ..	600 0 0	
Sale of water	25 0 0		Office rent and stationery ..	60 0 0	
Weighbridge fees	40 0 0		Rates	63 0 0	
		2,715 0 0	Auditors' and legal fees ..	60 0 0	
Interest from bank for money lodged ..		5,750 0 0			783 0 0
			Pilot and wharf departments	..	200 0 0
			Bank interest on overdraft ..	..	500 0 0
			Miscellaneous	..	300 0 0
			Balance of Sinking Fund, 1887	372 5 10	
			Balance of Sinking Fund, 1888	562 0 0	
					934 5 10
			Balance	..	4,614 6 0
	£8,465 0 0				£8,465 0 0

INTEREST ACCOUNT.

Receipts.	£ s. d.	£ s. d.	*Expenditure.*	£ s. d.
Outstanding rates, 1887		1,900 0 0	Interest on loan	10,000 0 0
Rate of 1d. on borough property	1,290 0 0		Bank charges, say	200 0 0
Rate of ½d. on county property	2,910 0 0			
		4,200 0 0		
Transfer from General Account		4,100 0 0		
		£10,200 0 0		£10,200 0 0

In order to ascertain the position correctly, it will be better to eliminate outstandings, thus:—

	£ s. d.	£ s. d.
Estimated Expenditure to 31st December, 1888—		
Refund to Loan Account, being one-tenth legal overdraft	1,083 8 2	
Advertising and printing	50 0 0	
Salaries and office expenses	783 0 0	
Pilot and wharf departments	200 0 0	
Bank interest and miscellaneous	800 0 0	
Sinking Fund for 1888	562 0 0	
Interest on loan	10,000 0 0	
Bank charges	200 0 0	
		13,678 8 2
Estimated Receipts to 31st December, 1888—		
Port charges, dues, &c.	2,715 0 0	
Interest on balance of loan	5,750 0 0	
		8,465 0 0
Deficiency		£5,213 8 2
Amount to be derived from rate of 1d. in the borough and ½d. in the county		£5,071 14 10

This shows that the revenue to be derived from all sources, together with rates of 1d. and ½d., will not cover the expenditure for this year.

For the next year, ending 31st December, 1889, I will estimate the position as follows:—

1889.	£ s. d.	£ s. d.
Expenditure, as for 1888		13,678 8 2
Receipts—		
Port charges and dues	2,815 0 0	
Interest on balance of loan	3,200 0 0	
		6,015 0 0
Deficiency		£7,663 8 2
To make up this it will be necessary to increase the rates to 1½d. in borough and ¾d. in the county, yielding		£7,607 12 3

—which shows that next year it will be absolutely necessary to increase the rates.

It seems to be generally supposed that the present Act does not give power to levy a higher rate than 1d. and ½d.; but, after carefully studying it, I should understand otherwise. In clause 23 of "The Gisborne Harbour Board Empowering Act, 1884," it states that the Board may "make and levy a rate in the proportions in the different parts of the district hereinafter mentioned, not exceeding one penny in the pound *upon all rateable* property in the harbour district." Clause 25 provides also that "The rate to be levied under this Act on the rateable property in the Borough of Gisborne shall be *double* the rate to be levied on the rateable property in the several ridings."

According to information supplied to me by the Secretary as to the present rateable value, calculated at 1d. in the pound, the amount yielded would be: Total rateable value, including Crown and Native lands in borough and county, £2,119,367, at 1d. = £8,830 13s. 11d.

In order to comply with the Act the maximum rate should be divided thus, approximately:—

	£		£ s. d.
Borough	309,998		
Crown lands	5,065		
		315,063 at 1·75d. =	2,297 6 8
County	1,396,380		
Crown lands	135,906		
Native lands	272,018		
		1,804,304 at 0·875d. =	6,578 4 8
			£8,875 11 4

In the above, the borough is rated double what the county is, the average rate on all not exceeding 1d. If this view be correct the Board have probably power to raise funds to pay their way until the completion of the works.

It is generally supposed that "The Crown and Native Lands Rating Act, 1882," will be repealed; but I have taken no notice of this in the foregoing estimates. In the case under notice the repeal of that Act would relieve a large portion of Cook County from bearing its fair share of taxation, and which would, in consequence, bear all the more heavily upon the few settlers who have been for some years struggling to improve their holdings. I have made an allowance for a small increase from port charges and wharfage, but, unless Crown land is thrown open and the restrictions removed from dealing in Native land, no extension of settlement can be looked for, nor any great improvement made in the present holdings, so that trade must stagnate.

Should the yield of petroleum prove a fact, and that its export will be remunerative, at least two years must elapse before a pipe-line can be laid and refineries built capable of turning out an oil that could compete with the American, even in colonial markets.

The Board's endowment of the Tauwhareparae Block, containing 44,150 acres, can be made no use of until properly opened up by roads, so that no revenue can be counted upon from this property at present. On the contrary, the Board has to pay rates upon it amounting to £50 per annum.

It is useless attempting to estimate the probable position of the Board beyond the end of 1889, as it is patent that, unless there is a very considerable increase in the trade of the port, or assistance rendered either by a further land-endowment, or annual grant of money by Parliament, the position must go from bad to worse, owing to the fact that the amount received from interest on the balance of the loan unexpended decreases yearly.

The present assessment of property appears to be very high, so that I do not think the rateable values will show any considerable increase for some years. The present rating-powers of the Board only extend to lands situated within five miles of a county road, so that a large portion of the county escapes.

I have stated that no large increase of revenue can be looked for for some time from port and wharf dues. I arrived at this decision after studying the returns of the chief exports for the years 1884 and 1885, as published, and for the year ending 31st March, 1888, obtained from the Customs Department and Wharfinger.

Articles.		1884.	1885.	1887–88.
Wool	bales	6,818	6,020	6,458
Grass seed	sacks	4,294	5,233	6,934
Sheep	No.	9,838	11,525	10,311
Cattle	"	114	304	76
Hides	"	1,583	1,331	1,600
Skins	bales	101	158	99
Tallow	tons	76	49	89

The above only includes the exports from Gisborne, a large portion of the produce of Cook County being shipped elsewhere. It however would denote that the district surrounding the port, embracing most of the richest land, has made but little progress during the four years, grass seed being the only article showing a marked increase. In explanation, I should infer that the extension of settlement has been arrested, and further improvements to property stopped. There is a want of capital and population, and, in order to attract these, it is suicidal to impose a steadily-increasing rate.

The number of sheep in Cook County from 1884 to 1887 is returned as follows: 1884, 307,973; 1885, 324,399; 1886, 386,387; 1887, 452,394—indicating a steady increase in the stock-carrying capacity, amounting to 46 per cent. in the three years included in this return. At the same time the export of wool from Gisborne has been stationary. It is evident, therefore, that the increase has taken place in districts remote from Gisborne, and where the wool has been probably shipped through the surf, or at the roadsteads and bays along the extensive coast-line. Owing to the configuration of the country, this will probably continue, even were the interior better provided with roads, as all produce will take the shortest route to the coast where shipment may be possible. Projected future improvements to the port of Gisborne, if on a large scale, may revolutionise this, as produce shipped on the coast may be collected and transferred to ocean steamers there.

The population of Cook County is given thus :—

	1881.	1886.
Borough of Gisborne, including North Gisborne, and on shipboard	1,737	2,565
In ridings	1,740	2,603
Totals, excluding Maoris	3,477	5,168

—being an increase of 49 per cent. in five years.

Another possible source of revenue is from the endowments of the Tauwhareparae Block and the foreshores of the river at Gisborne. The Board obtained a special report upon the former in 1887, a perusal of which leads one to the conclusion that no return can be looked for until a considerable sum is spent in opening it up by roads. It is stated to be only fit for pastoral purposes, and if opened by good roads, costing £2,000, its value is put at £30,591 15s. Unless facilities of access could be offered to settlers, it would be useless to offer the block for lease. The shortest road which could be constructed would be to Tologa Bay, which is twenty miles from the centre of the block. Only ten miles of new track would be required, the estimated cost of which, 5ft. in width, was £700. The endowment of the foreshores of the Turanganui and Taruheru Rivers, between high and low water, is about two hundred acres in extent. Nothing is at present obtained from this, though in course of time, as the trade increases, it will become of value. No revenue can be looked for for some years from this endowment.

In attempting to estimate the probable position of the Board upon the completion of the works, I find that it will be almost impossible to arrive at anything like a correct conclusion, as it depends altogether upon the progress of the district for the next five or six years. Should the Crown and Native lands be thrown open for settlement, and population encouraged to proceed there, considerable expansion of trade might result; also, should the petroleum industry prove remunerative, it would alter the whole aspect of affairs.

Allowing for an increase in trade in anticipation that the land will be open for settlement, but not for the possible establishment of the oil industry, I estimate that the position will be as follows in 1893 :—

Expenditure—	£	
Refund to Loan Account (annually for 10 years) ...	1,083	
Salaries, rent, and office expenses	1,600	
Maintenance of works	500	
Sinking Fund	562	
Interest on Loan, &c.	10,200	
	———	13,945
Receipts—		
Port charges	1,000	
Wharf dues	3,000	
Rent of Tauwhareparae Block	500	
	———	4,500
Deficiency		£8,445

As I have before shown, a rate of 1·75d. in the borough and 0·875d. in the country would yield £8,875, which is nearly equivalent to an average rate of 1d. on all property in the county. This full rate would probably have to be imposed, though I have not allowed for any increase in rateable values, which might reduce it somewhat.

The oil industry is the only thing that can alter this position, and which may assume such magnitude as to altogether relieve the district of its burden. It is estimated that the probable yield of the South Pacific well will be not less than a hundred barrels per diem. This oil, if all exported in some form or another, will amount to nearly 1,500,000 gallons per annum, or 8,500 tons, which at the present wharfage rates would yield £1,062 per annum; in addition to which there would be the increased shipping dues, the importation of machinery, the increase in population, and general impetus that would be probably given to trade. There are three more wells being put down, one of which, the Minerva, is already 800ft. deep, and expects to strike oil at about 1,100ft. Should these wells succeed, a considerable increase of revenue to the Board may be looked for. . . .

I find that for the years 1886 and 1887 the average importation of kerosene into New Zealand for twelve months was a little over 1,000,000 gallons, valued at £49,203. It will therefore be evident that a market must be sought for the oil in other countries, where it must compete on equal terms with the American. I consider that the prospect of this industry is so hopeful that every means should be taken to encourage it. A few months will decide as to the yield of the wells, while the number to be put down will probably depend upon the possibility of competing with America.

The difficulty that now faces the Board is how to pay the interest during construction. After the completion of the works, what with the natural development of the country, the prospects of an oil trade, &c., the revenue may go a long way towards meeting the interest, so that only a small tax may be necessary in order to make up the deficiency. The imposition of the full rate upon property will enable the Board to meet its engagements, but I should doubt the wisdom of trusting to that means, as it must obstruct progress, shut out settlement, and depreciate the value of property.

6. "*The Capabilities of the District to bear the Burden of the present Rate, or such a Rate as it may be necessary to impose, without placing too heavy a Tax on the Inhabitants and hindering the Progress of Settlement.*"

Although the rate now levied of ½d. in the country and 1d. in the borough has been shown to be insufficient for the purpose of enabling the Board to meet its engagements after this year, I find that there is a general feeling that the district cannot bear a higher one, as it would press too heavily on the many struggling settlers who are already heavily taxed, and who, owing to the general depression existing, look with dismay upon the prospect in store for them. Many hold the opinion that a mistake has been made in voting for the prosecution of a work which must entail so heavy a burden upon the present generation. The interest of the loan amounts to an annual tax of nearly £2 per head of the population.

It is claimed that this district has received very little assistance from Government, and has obtained no fair share of the expenditure upon public works, but is now heavily taxed in conjunction with the rest of the colony to meet the interest of the public debt, to so large an extent expended upon railways from which the settlers are entirely shut out. From its position the district is isolated from the railways and roads constructed in other parts of the colony. Its only outlet is the sea, and it is in endeavouring to develop the facilities afforded it in this direction that the settlers have taken the lead, and now claim that Parliament should afford them some assistance, and relieve them from what must be a heavy burden until after the works are completed and the district developed. From a return supplied by the Clerk of the County Council it appears that between the years 1877 and 1887 the total amount of Government money expended in Cook County for roads, tracks, and bridges, other than that expended by the Survey Department, has been £39,264.

From the report made by Mr. C. B. Knorpp, Inspecting Engineer, when exploring the country between Napier, Gisborne, and Opotiki, and the maps attached to it, it will be seen that the classification of land in the county is shown as principally first-class pastoral. These maps give a very good idea of the nature of the country, as the classification is said to be a fairly accurate one. In order to bring it into a productive state the expenditure of both capital and labour is necessary, and, from what I was enabled to see of the hill-country, I should certainly consider that, from the nature of soil and climate, it must eventually become a first-class pastoral district. Although there is a considerable area of splendid alluvial land near Gisborne, capable of high cultivation, the bulk of the district is essentially pastoral, but capable of great improvement.

It is stated that the increase of rateable value of county property between 1882 and 1887 amounted to £171,475, during which period there has been very little increase of settlement; that hardly any Crown lands have been taken up or placed in the market, and that the passing of "The Native Land Laws Amendment Act, 1883," has caused the dealings in Native lands to practically cease. Thus, during these years little progress has been made in the extension of settlement; consequently the calculation made by the Harbour Board, based upon the supposition that settlement and progress would yearly extend, has broken down. It is also stated that the Board applied to the Government for aid in paying the interest during construction before any money was expended, and that they have always relied upon obtaining such aid; and that, had the Government never intended to grant them such assistance, the work should not have been allowed to go on. The letter from the Marine Department to the Board, dated the 29th November, 1886, which I previously quoted, would negative this statement.

It has also been suggested that it would be acting in the public interest if Parliament were to take over the unexpended portion of the loan and carry out the works to completion, reserving the right to rate the district up to ½d. and 1d.; and it is maintained that were this done, if followed up by the construction of roads and tracks to open up land, and thereby help to settle the interior of the country, it would be a profitable transaction both directly and indirectly; that people who are inclined to settle in the district where good land can be obtained are not prepared to face the difficulties and disadvantages of want of access, a safe harbour, and, in the meantime, bear the imposition of a harbour rate upon property in addition to other rates and taxes. There is not the least doubt that to stop the works at present means that no benefit will arise from the expenditure of over £70,000, as the works are not yet far enough advanced to be of use to even the smallest class of vessel that frequent the port, or even render any protection to the bar and entrance of the river.

I am unable to report under this head further than that, in my opinion, the imposition of a heavier rate than that now levied—viz., 1d. and ½d.—would create a bar to the progress of the settlement. The settlers no doubt voted for the loan with their eyes open, but were misled by the over-sanguine estimates of the probable progress of the district, which have not been verified, owing, it is now said, to circumstances beyond their own control, as previously stated—viz., the passing of "The Native Land Laws Amendment Act, 1883."

I may point out that the Board when framing their estimate of the probable financial position during 1888, calculated upon obtaining 5 per cent. interest upon the unexpended portion of the loan, whereas now they are only receiving 4 per cent. They expected to obtain a revenue of £500 per annum from the Tauwhareparae Block, and £250 per annum from the rent of the foreshores, from neither of which do they obtain anything, but, on the contrary, pay £50 in rates.

The present harbour rate presses heavily upon many settlers along the seaboard who make no use of the Port of Gisborne, and probably never will, as they ship their wool direct into coasting vessels at various points.

In making this inquiry I have been afforded every assistance by the Chairman and members of the Board, as also by the whole of the residents in both town and country, who placed every means at my disposal to enable me to make as complete a report as possible. I have not entered into any description of the work now being constructed, as I was not specially instructed to do so, but I may add that I was thoroughly satisfied with its character and the manner in which Mr. Thomson is carrying it out. As I before mentioned, the plant is most complete and well arranged. The concrete blocks are well made, and the quality as good as could be expected from the description of sand at first used, which was too fine. The sand now made use of is dredged from the end of the work, and is much coarser and better suited for this class of concrete. The pier itself is thoroughly well built, and considerable care is taken to insure a good foundation.

In conclusion, I may state generally that I consider the work to be very creditably and faithfully carried out.

H. P. Higginson, M.Inst.C.E.

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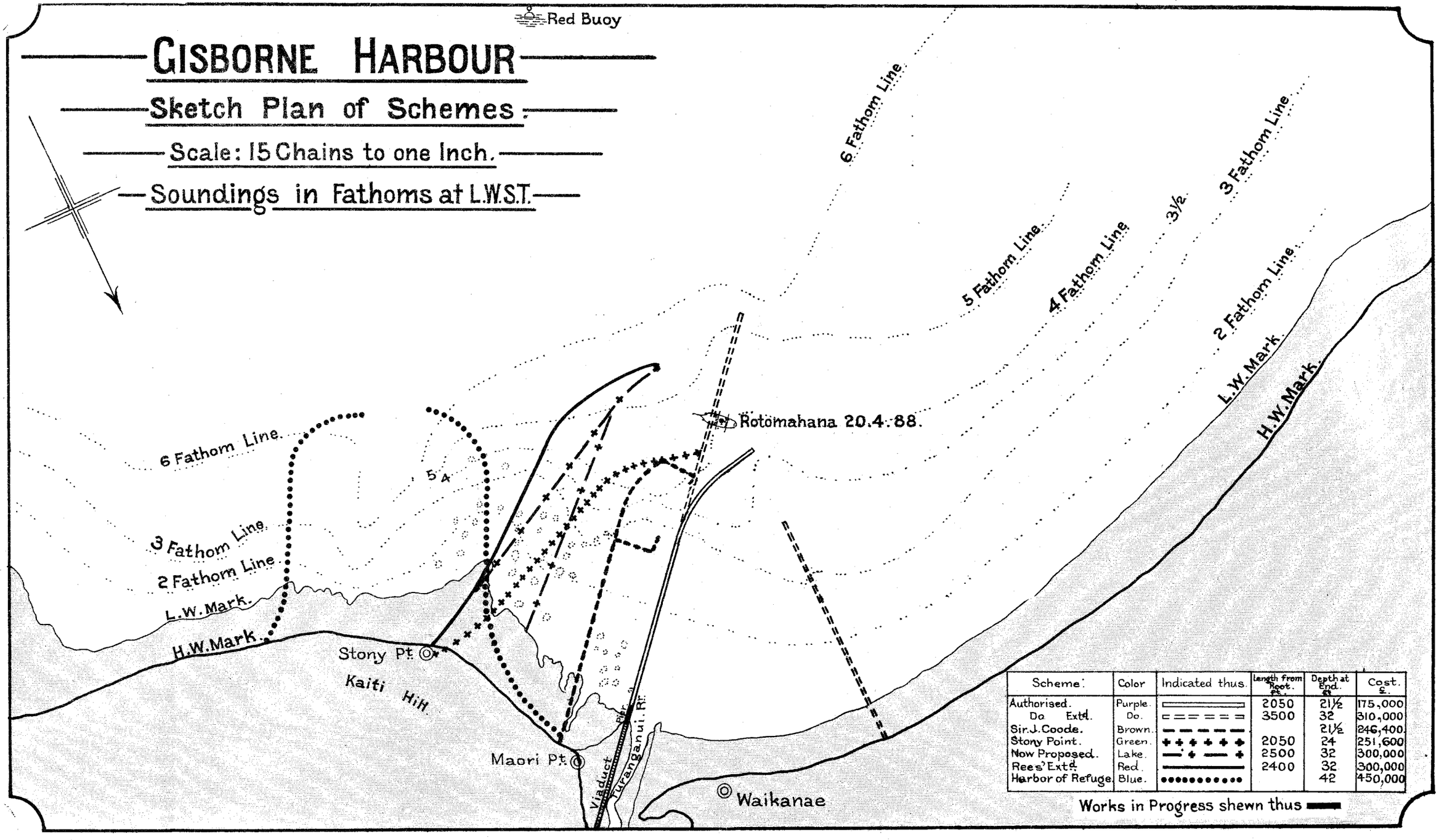
GISBORNE HARBOUR

Sketch Plan of Schemes.

Scale: 15 Chains to one Inch.

Soundings in Fathoms at L.W.S.T.



Scheme.	Color	Indicated thus.	Length from Root. Ft.	Depth at End. Ft.	Cost. £
Authorised.	Purple.		2050	21½	175,000
Do Extd.	Do.		3500	32	310,000
Sir J. Coode.	Brown.			21½	246,400
Stony Point.	Green.		2050	24	251,600
Now Proposed.	Lake.		2500	32	300,000
Rees' Extd.	Red.		2400	32	300,000
Harbor of Refuge.	Blue.			42	450,000

Works in Progress shewn thus